

REMARKS

Claims 1-8, 10-14, 16-24 and 26-41 are currently pending in the subject application, and are presently under consideration. Claims 1-38 stand rejected. Claims 1, 10-13, 18, 21, 26, 28, 30 and 34 have been amended and new claims 39-41 have been added. Claims 9, 15 and 25 have been cancelled.

Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Rejection Under 35 U.S.C. §112

Claim 25 has been cancelled such that the rejection under 35 USC 112, second paragraph, is moot. Claims 10-12 have been amended to correct typographical errors as suggested in the Office Action.

II. Rejection of Claims 1-38 Under 35 U.S.C. §103(a)

Claims 1-38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. No. 6,711,662 to Peir et al. (hereinafter, "Peir et al.") in view of US Pat. Pub. 2002/0133674 to Martin et al. (hereinafter, "Martin et al."). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 1 has been amended to incorporate the subject matter of claim 9. Accordingly, the following comments regarding amended claim 1 will address the rejections in the Office Action for original claims 1 and 9.

The Office Action contends that the combination of Peir et al. in view of Martin et al. renders original claim 9 (now amended claim 1) obvious. Specifically, the Office Action relies on Peir et al. for its teaching of "prediction based on ownership history" to meet the recitation that a first component of a given owner predictor predicts an owner node of the block of data by observing the pattern of instructions with the processor. Office Action, at page 6, lines 5-8. In sharp contrast to amended claim 1, however, the particular type of prediction described in Peir et al. relates to predicting a next requestor of a block of data. Peir et al. at Col. 3, lines 3-11. This prediction is further described as a mechanism to determine who will be the next requestor so

that the prediction facility can send current owner information to the predicted next requestor. Peir et al., at Col. 3, lines 40-54. There is no teaching in Peir et al. or Martin et al., taken individually or in combination, for predicting an owner node of a block of data, as recited in claim 1. It further must be recalled that the first component of the owner predictor in amended claim 1 is in addition to a second component of the owner predictor that stores the ownership update messages.

Additionally, the mention in the Office Action that the prediction table can be indexed by the block of data (See Office Action at page 6, lines 8-12) again relates to history that is utilized to predict a next requestor, which does not correspond to a component that stores ownership update messages from the owner predictor control of amended claim 1.

The addition of Martin et al. does not cure the deficiencies of Peir et al. since Martin fails to teach or suggest the owner predictor control and the components of the owner predictor recited in amended claim 1. Significantly, the predictor 98 is described in Martin et al. as being used to predict which processors are likely to have copies of the block 19 being sought. There appears no basis in the record to support that the predictor 98 of Martin et al. would or could be used with the prediction facility of Peir et al. The Office Action alleges that “doing so would provided for an [sic] unit to properly coordinate functions of the predictor and also control communications between the predictor and the other components of the invention.” Office Action at page 3, lines 18-22. This purported motivation seems to ignore that the coordination of between the prediction facility 22 and the current-owner table at each node already exists in the system of Peir et al. without any need or reason to combine with Martin et al.

For the reasons discussed above, amended claim 1 is patentable and its allowance is respectfully requested. Claims 2-8 and 10-12 and new claims 39 and 40 depend from claim 1 and are patentable for at least the same reasons.

Additionally, claim 11 has been amended to correct a typographical error as well as to depend from amended claim 1. The Office Action alleges that the claimed prioritization is disclosed in Peir et al. at Col. 2, lines 3-11. However, neither the cited section of Peir et al. nor Peir et al., more generally, teaches any mechanism that might be utilized to prioritize an update message. The update message recited in claim 11 (it must be recalled from amended claim 1) is

provided in response to a change in ownership state. The prediction table described in Peir et al. appears only to be used in predicting a next requestor. Peir et al. contains no teaching or suggestion of ever a component that predicts ownership and a component that is operative to prioritize update messages according to a determination at the component that predicts ownership. The basis in the rejection appears to stem from a fundamental misunderstanding of Peir et al., which predicts a next requestor and sends current owner information to the predicted next requestor. Peir et al. Col. 3, lines 40-50. Accordingly, reconsideration and allowance of claim 11 are respectfully requested.

Claim 12 has been amended to correct a typographical error as well as to depend from amended claim 1. The Office Action relies on Peir et al. at Col. 3, lines 42-44 to support the rejection of claim 12. Again, the prediction facility 22 in Peir et al. is used to predict not an owner, but to predict a next requestor of a data block whenever a new owner is identified. For instance, why would the prediction facility 22 be used predict an owner when an owner has already been identified? In contrast to Peir et al., claim 12 provides an owner predictor with flexibility in accessing the first component or the second component (from original claim 9, now in amended claim 1) according to the frequency in which the owner predictor receives ownership update messages from the owner predictor control. Such a selection simply is not an option from the combined teachings of Peir et al. and Martin et al. Thus, Applicant respectfully requests reconsideration and allowance of amended claim 12.

Claim 13 has been amended to substantially incorporate the subject matter of claim 15 such that these comments address the rejection of both original claims 13 and 15 in the Office Action. Thus, amended claim 13 now recites that the owner predictor control broadcasts an update message to respective owner predictors associated with each of a plurality of processors comprising the multi-processor network. In marked contrast, a primary object in Peir et al. relates to use of a prediction facility 22 to provide current owner information to a predicted next requestor. Peir et al. Col. 2, lines 60-67. Even the explicit mention of the scenario when a data block can be accessed by a single writer and multiple readers, Peir is clear that the next requestor can be extended a small set - and not all - of processors. See Peir et al., Col. 3, lines 33-39. For instance, if all processors would receive the current owner information, as is being suggested in the Office Action, at page 8, lines 1-5, then there would be no purpose or need for the prediction

facility 22 in the system 10. Such a contention (that the prediction facility be disregarded), however, runs directly contrary to Peir et al.'s teaching as a whole. Thus, the suggested modification would render the teachings of Peir et al. inoperative for its intended purpose. Consequently, there is no teaching or suggestion in Peir et al. to broadcast an update to respective owner predictors for each of the plurality of processors, as recited in amended claim 13. Instead, the prediction facility 22 of Peir et al. is disclosed as a part necessary for operation of the system 10 so that the requestor or a small set of requestors can receive the current owner information. Accordingly, reconsideration and allowance of claim 13 are respectfully requested along with claims 14 and 16-20 that depend from claim 13.

Claim 21 has been amended to recite that an owner predictor is associated with each of a plurality of processor nodes that form the system and that the update control provides an ownership update message to the owner predictor associated with of the plurality of processor nodes. Claim 21 and its dependent claims 22-24 and 26-29 thus should be patentable for at least the same reasons discussed above with respect to claim 13. Claim 25 has been cancelled. Additionally, claim 26 has been amended to depend from claim 23 to correct an inadvertent error and to provide proper antecedent basis for the third request that is provided by the home node.

Additionally, regarding claim 27, the Office Action relies on a teaching in Peir et al. at Col. 4, lines 51-67. However, in contrast to claim 27, the cited section of Peir et al. specifically states that "[i]f processor C is indeed the actual current owner (step 38), the home directory 20 will not respond to the inquiry; otherwise, the prediction facility 22 updates the prediction table to reflect the ownership of data X (step 40)." Peir et al. at Col. 4, lines 61-64. Thus, Peir actually teaches that the home node does not respond if the predicted owner C is actually the owner, whereas claim 27 recites that the home node provides a speculation acknowledgement to the requesting node in response to the victim message from the owner. Peir et al. further fails to teach that the owner provides victim message to the home node, as it discloses that the home director checks if processor C is the actual current owner (Pier et al. Col. 4, lines 59-61) and does not send any victim message to the home node in response to the third request (from the home node) arriving at the owner node before the second request (from the requesting node). Claim 27 thus recites a particular timing relationship between the requests and the victim message that is

not taught in the cited section of Peir et al. For these reasons, reconsideration and allowance of claim 27 are respectfully requested.

Claim 28 has been amended to correct a typographical error by reciting that the owner node provides the data response to the requesting node in response to the second request from the requesting node. The Office Action relies on the same section of Peir et al. as was used to reject claim 27, namely the description relative to FIG. 3B. Similar to as discussed with respect to claim 27, Peir et al. fails to teach or suggest taking that an owner node (i.e., C in Peir et al.) sends a victim message to the home node. Instead, it seems that the node C (if it is determined that C is the actual current owner (See decision block 35 of FIG. 3B) only sends a response to P (the processor). There is no mention in Peir et al. that the owner C would send a victim message in response to a second request arriving at the owner node prior to a request from the home node, as recited in claim 28. Since claim 28 recites a particular timing relationship between the requests and the victim message is not taught in the cited section of Peir et al., reconsideration and allowance of claim 28 is respectfully requested.

Claim 30, which is written in means plus function format, has been amended to recite that a respective one of the means for identifying is associated with each of a plurality of nodes in the multi-processor system. Claim 30 has also been amended to recite means for broadcasting updates to all the means for identifying. In view of the amendments to claim 30, claim 30 should be allowed for substantially the same reasons as discussed above with respect to claim 13. Claims 31-33 depend from claim 30 and thus are patentable for at least the reasons that claim 30 is patentable.

Claim 34 has been amended to recite that ownership state information for a block of data is updated at each of a plurality of owner predictors. Clarification has also been made to recite that a processor is identified as a predicted owner based on the updated ownership state information in a given one of the plurality of owner predictors for a respective processor. Thus, since the ownership state information is updated in each of the plurality of owner predictors, for substantially the same reasons as discussed above with respect to claim 13, claim 34 is not obvious over the combination of Peir et al. and Martin et al. Claims 35-38 depend from claim 34 and thus are patentable for at least the reasons that claim 35 is patentable.

III. New Claims

New claims 39-41 have been added to supplement cancelled claims already paid for. New claims 39 and 41 depend from claim 1 and 13, respectively, and recite additional functionality of the owner predictor control. Support for this amendment can be found at least, for example, at paragraph [0052] of the present application. New claim 40 depends from claim 1 and recites that the owner predictor control is configured to broadcast the ownership update message to each of the plurality of owner predictors, similar to amended claim 13. Allowance of these new claims is respectfully requested.

IV. Conclusion

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for new claims due to the cancellation of other claims. Fees for a one-month extension of time are being charged via a separate transmittal paper to Deposit Account No. 08-2025. In the event any additional fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on March 3, 2008.

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